PATENT CLAIMS

1. A device for measuring the distance (d) to far-off and close objects (8) by which laser beams (1) modulated and emitted by the device are reflected, comprising

- a common objective (2) for emitting the laser beams (1) and for collecting rays which comprise laser beams (3) reflected by the objects and background rays (28),
- means (12, 36, 38, 39, 40) for selecting rays of a cohesive cross-sectional region (34, 37) of a bundle of collected rays which has a first (5) and at least one second section (6), laser beams (3) reflected by a far-off object being coordinated with the first section (5) and laser beams (3) reflected by a close object being coordinated with the at least one second section (6) and only a fraction of the collected laser beams (1) reflected by the close object being selected via the second section (6), and
- a receiver (7) for converting selected rays into a single electrical signal, by means of which the distance (d) can be determined with the aid of the propagation velocity of optical rays,

wherein the means (12, 36, 38, 39, 40) are formed in such a way that the at least one second section (6) has at least the dimension of the first section (5).

2. The device as claimed in claim 1 for measuring the distance (d) to an object (8) which reflects with orientation, wherein the emitted laser beams (1) are in the form of a decollimated bundle of rays.

3. The device as claimed in claim 1 or 2, wherein the means (12, 36, 38, 39, 40) are formed in such a way that the selected cross-sectional region (34) has at least two second sections (6) between which a single first section (5) is arranged, and wherein optionally the selected cross-sectional region (34) is symmetrically formed.

4. The device for measuring the distance (d) to far-off and close objects (8) which reflect with orientation and by which the laser beams (1) which are modulated and emitted by the device and are in the form of a decollimated bundle of rays are reflected, comprising

- an objective (2) for collecting rays which comprise laser beams (3) reflected by the objects and background rays (28),
- a further objective (41) for emitting the laser beams (1),
- means (40) for selecting rays of a cohesive cross-sectional region of a bundle of collected rays which has a first (5) and a second section (6), laser beams (3) reflected by a far-off object being coordinated with the first section (5) and laser beams reflected by a close object being coordinated with the second section (6) and only a fraction of the collected laser beams (1) reflected by the close object being selected via the at least one second section (6), and
- a receiver (7) for converting selected rays into a single electrical signal by means of which the distance (d) can be determined with the aid of the propagation velocity of optical rays,

wherein the means (40) are formed in such a way

that the second section (6) has at least the dimension of the first section (5).

5. The device as claimed in any of claims 1 to 4, wherein the means (12, 38, 39, 40) are formed in such a way that the second section (6) has a larger dimension than the first section (5).

6. Device as claimed in claim 5, wherein the means (12, 38, 39, 40) are formed in such a way that the selected cross-sectional region (34) tapers starting from the second section (6) toward the first section (5) in such a way that, during measurement to the object (8) which reflects with orientation, at different distances (d) from close to far-off, the respective differences between the intensity of selected rays are reduced.

7. The device as claimed in any of claims 1 to 6 for measuring to an object (8) which reflects with orientation and to an object which reflects with scattering, wherein, for measurement to the object which reflects with scattering, the emitted laser beams are in the form of a collimated bundle of rays.

8. The device as claimed in claim 7, wherein the means (12, 36, 38, 39, 40) are formed in such a way that the selected cross-sectional region (34) tapers starting from the second section (6) toward the first section (5) in such a way that, during measurement to the object (8) which reflects with orientation and to the object which reflects with scattering, in each case at different distances (d) from close to far-off, the respective differences between the intensity of selected rays are reduced.

9. The device as claimed in any of claims 1 to 8, wherein at least one multimode optical fiber (10) is provided for the transmission of selected rays.

10. The device as claimed in claim 9, wherein the means (39) for selection are in the form of an endpiece of a multimode optical fiber (10) which endpiece has been squeezed together in an elongated manner.

11. The device as claimed in any of claims 1 to 9, wherein the means (12) for selection are in the form of a diaphragm, for example in the form of a slit diaphragm or in the form of a crossed-slit diaphragm, optionally in combination with the entry area of the multimode optical fiber (10).

12. The device as claimed in any of claims 1 to 9, wherein the means for selection are in the form of a reflective, refractive or diffractive optical element, for example in the form of a cylindrical lens (36), free-form lens or optionally metallized light-collecting funnel, optionally arranged before the entry area of the multimode optical fiber (10).

13. The device as claimed in any of claims 1 to 9, wherein the means for selection are in the form of a detector (40) having an elongated, active detection area (42).

14. The device as claimed in any of claims 1 to 13, wherein means (12, 36, 38, 39, 40) for selection are arranged in the vicinity of the focal plane (20) of the objective (2) for collecting rays.

15. The device as claimed in any of claims 1 to 14, wherein an eyepiece (23) is provided, the eyepiece (23) and the objective (41) forming a telescope for sighting the objects (8).